FRD Activities Report
January 2000

Research Programs

Hurricane Balloons

The successful operation of the smart hurricane balloons depends on having differentially corrected positions from the on-board GPS receiver. This requires that the differential correction information be relayed from the ground control station to the balloon's microprocessor and then passed on to the GPS receiver. This method of providing the differential correction information to the GPS receiver was successfully demonstrated for the first time this month. The entire system worked as planned and no problems are anticipated in the final implementation. (Roger.Carter@noaa.gov, Randy Johnson)

Shoaling Waves Experiment (SHOWEX)

Post-calibration and processing of LongEZ data collected in Duck (November 1999) are complete. Version 2.0 of the data is currently being disseminated to PIs outside NOAA/ARL for their continued analysis. In-house data analysis will, in the immediate future, concentrate on quality assurance and momentum and sensible heat fluxes in light wind conditions coupled with sea-state. A final data report in the form of a NOAA technical memorandum is in preparation.

In addition, we are investigating possible ways to improve on measurements for any future programs. Preliminary data analysis suggests we can improve the accuracy of our wind measurements, and further testing of the sensing elements (bat probe) is required.

The SHOWEX database is starting to take shape. Difax weather maps have been archived. These include surface analysis maps every 3 hours and twice-daily upper-air maps at 850, 700, and 500 mb. GOES-8 visible and infrared satellite images of southeastern United States is also included. These images have been acquired every 15 min. In addition, numerous digital photos of the LongEZ and its respective sensors are available. (Jeff French@noaa.gov, Jerry Crescenti, and Tim Crawford)

Cooperative Research with INEEL

Controversy Continues Over Proposed Advanced Mixed Waste Treatment Facility (AMWTF)

The controversy in Jackson, WY continues to heat up over the risk of radionuclides being released from the proposed AMWTF at the INEEL. A lawsuit has been filed by the group “Keep Yellowstone Nuclear Free” to block the construction of the facility. Regulatory model calculations indicate that the residents of Jackson, a city located some 100 miles to the east of the INEEL, will not be significantly impacted. To help educate the residents of Jackson, the INEEL Jackson, WY office manager requested a FRD representative visit the Jackson office and meet

with the public. Kirk Clawson subsequently traveled to Jackson, WY and met privately with several area residents and gave a presentation in the city library conference room to an audience of about 40 people on atmospheric stability, transport and diffusion, INEEL surface and aloft wind field patterns, and FRD's modeling efforts for other INEEL facilities. The presentation generated enough excitement that it was reported by all the area newspapers and by two of the local television stations. (Kirk.Clawson@noaa.gov)

Mixing Depth Measurements on the INEEL

Data from the INEEL 915 MHz radar profiler is now being used to calculate the mixing depth or depth of the planetary boundary layer. The calculation runs automatically every 30 minutes and the mixing depth is stored with the profiler's wind measurements in the mesonet database. If this technique proves to be reliable, the mixing depth will be incorporated into transport models used at the INEEL. The calculation is based on a method described by Allen B. White using the signal to noise ratio of the returned radar signal. (Allen B. White, *Mixing Depth Detection Using 915-MHz Radar Reflectivity Data*, Eighth Symposium on Observations and Instrumentation, Jan. 1993, AMS) (Roger.Carter@noaa.gov)

Emergency Operations Center Support (EOC)

The remodeling of the INEEL Emergency Operations Center (EOC) has been completed. FRD worked with the emergency planning organization to complete installation of the computer equipment required by the meteorologists during EOC activations. A dedicated data link between the FRD office and the EOC was installed. The data link is currently working very well and provides access to complete National Weather Service products through the Marta system and also the capability to access the INEEL mesonet data in a wide variety of formats. These capabilities were not available before the EOC remodeling and will definitely enhance the services that FRD can provide in the EOC. The New Year's Eve Y2K EOC activation presented an excellent opportunity to use the new system. FRD provided support personnel through the evening. No Y2K problems were noted in any FRD computer programs or equipment. (Roger.Carter@noaa.gov)

Other Activities

Call for Papers - Symposium on Meteorological Observations and Instrumentation (SMOI)

The 11th Symposium on Meteorological Observations and Instrumentation, sponsored by the American Meteorological Society and organized by the AMS Committee on Measurements, will be held January 14-19, 2001 as part of the 81st AMS Annual Meeting in Albuquerque, New Mexico. A preliminary program, registration, hotel and general information will be posted on the AMS Web site (http://www.ametsoc.org/AMS) in late September 2000. Presentations are solicited on all aspects of atmospheric measurements (in situ and remote), observations, quality assurance and quality control, instrumentation technologies, sensor performance, network design, and sampling strategies. Both research and operational instrumentation and measurement techniques are welcome.

Papers are solicited in the following areas, but are not limited to:

1. new and evolving sensor technologies,
2. airborne measurement platforms,
3. sonic anemometers,
4. meteorological measurements in harsh environments (e.g., over the ocean, in polar environments, mountainous terrain),
5. long-term flux measurements,
6. quality-assurance and quality control issues on the acquisition of data from in situ and ground-based remote sensors,
7. air-sea interface measurements,
8. ground-truth measurement systems in conjunction with satellite remote sensors.

Deadline for abstracts is July 1, 2000 and can be submitted electronically. AMS will provide instructions to authors of accepted papers. Camera-ready manuscripts (page length to be determined), including photos and diagrams, must be submitted by October 1, 2000 to AMS Headquarters. Page charges will be assessed to defray printing costs. Registrants will receive a preprint volume at the conference. For further information contact Jerry H. Crescenti. (Jerry.Crescenti@noaa.gov)

Short Course - Introduction to Meteorological Instrumentation and Observation Techniques

In response to the lack of an instrumentation curriculum at most universities with meteorology programs, the AMS Measurements Committee is organizing a one-day short course on meteorological instrumentation and observation techniques. The focus of the course is on the basics of *in situ* monitoring and will be oriented towards undergraduate and graduate students. This course will be offered on Sunday, January 14, 2001 in conjunction with the 81st Annual Meeting of the American Meteorological Society in Albuquerque, New Mexico. The morning session will include opening remarks, and in-depth discussions on the principles of instruments and observing techniques. One or two scientist (to be determined) will give a brown-bag lunch seminar with “horror stories from the field” on the challenges of making measurements. The afternoon will include a “hands-on” session where class attendees can work with various meteorological instruments. Sensors will be on loan from various manufacturers who will be exhibiting their products at the Annual Meeting. The last hour of the course will be devoted to quality assurance and quality control issues. Thomas Lockhart (Meteorological Standards Institute), Robert Baxter (Parsons Engineering Science), and Scott Richardson (University of Oklahoma) will provide instruction for this course. (Jerry.Crescenti@noaa.gov)

ARL Booth in AMS Exhibit Hall

An effort is underway to develop an ARL Booth as part of the exhibit hall for next year’s 81st Annual Meeting of the American Meteorological Society in Albuquerque, New Mexico to be held January 14-19, 2001. This would be an excellent opportunity to "show off" to the rest of the meteorological community what ARL does. One volunteer from each ARL division as well as ARL Headquarters is being asked to help in the development of this booth.

Next year's Annual Meeting will represent a significant departure from previous annual meetings. The conference and symposium structure has been modified to create a scientific meeting that better serves the broad spectrum of attendees, with fewer conflicts and with opportunities for presentations that cover much of the breadth of the atmospheric and related oceanic and hydrologic sciences. A major emphasis will be placed on societal impacts. An ARL presence would at least keep some focus on air quality and climate issues.

It will be important that a "unified theme" be presented by ARL. This will be a challenge since ARL is quite diverse. One possibility is a presentation of our transport and dispersion model capabilities, from microscale through mesoscale, through synoptic scale and through global scale. Any suggestions, as well as the names of volunteers, will be greatly appreciated. (Jerry.Crescenti@noaa.gov)

New Network Hardware

Our crackerjack technicians are close to completing the installation of our new network. The building has been completely rewired with category 5 level 7 wire giving us a potential throughput of 500 Mbits/s. New Fast AutoSensing Ethernet Switches were purchased, providing automatic switching between 10 and 100 Mbits/s. This should greatly enhance the performance of data acquisition and high performance network applications. (Brad.Reese@noaa.gov)

Meteorologist Retirement

We are sorry to announce the retirement of one of our long time meteorologists, Jerry Sagendorf. His last day was December 30, 1999. He has been with FRD for nearly 30 years. We celebrated his retirement with a party on January 28. We will certainly miss him! Good Luck Jerry!

New Meteorologist

Of course, conservation of mass is observed here at FRD. Our new meteorologist is Dr. Rick Eckman who will be on board February 28, 2000. Dr. Eckman is transferring in from ATDD, and is an expert in mesoscale modeling and has published numerous papers on the subject.

New FRD Employees Association Officers

Paula Fee and Dianne Hoover have been elected as the President and Executive Secretary, respectively, of FRD's Employee Association. Their terms will run from January 31, 2000 to January 31, 2001.

Proposals

Mini Doppler Sodar for Transport and Diffusion Research, submitted to the NOAA's FY-00 DDF Allocation Program, submitted by Jerry H. Crescenti.

Papers Submitted

Businger, S., and R. Johnson, 2000: Evolution in the design of a smart balloon for Lagrangian air mass tracking. Preprint, *11th Joint Conference on the Applications of Air Pollution Meteorology with the Air & Waste Management Association*, Long Beach, CA, Jan. 9-14, Amer. Meteor. Soc., 321.

Clawson, K. L., J. F. Sagendorf, and R. G. Carter, 2000: Comparisons of a puff trajectory model with real time tracer measurements. Preprint, *11th Joint Conference on the Applications of Air Pollution Meteorology with the Air & Waste Management Association*, Long Beach, CA, Jan. 9-14, Amer. Meteor. Soc., 293-298.

Crescenti, G. H., and R. A. Baxter, 2000: Sodar based wind profiles as model inputs: Understanding the role of atmospheric conditions in assessing the quality of the data. Preprint, *11th Joint Conference on the Applications of Air Pollution Meteorology with the Air & Waste Management Association*, Long Beach, CA, Jan. 9-14, Amer. Meteor. Soc., 432-437.

Crescenti, G. H., K. L. Clawson, B. R. Reese, D. W. Walker, and W. J. Behymer, 2000: The Idaho Environmental Monitoring Program. Preprint, *Ninth Symposium on Education*, Long Beach, CA, Jan. 9-14, Amer. Meteor. Soc., 28-30.

French, J. R., J. H. Helsdon, and R. D. Farley, 2000: Microphysical and electrical evolution of a Florida thunderstorm 2. Numerical simulations. *J. Geophys. Res., submitted.*

Vogel, C. A., and T. L. Crawford, 1999: Exchange measurements above the air-sea interface using an aircraft. *Air-Sea Exchange: Physics, Chemistry and Dynamics*, G. L. Geernaert, Ed., Kluwer Academic Publishers, 231-245.

Papers Reviewed

Eckman, R. M., 2000: Evaluation of the REEDM climatological turbulence algorithm using aircraft measurements. NOAA Tech. Memo., *reviewed by Jerry H. Crescenti.*

Rosenfeld, D., Woodley, W. L., and B. A. Silverman, 1999: Obersvations of the role of coalescence on rainfall amounts from tropical convective clouds. *J. Appl. Meteor.*, *reviewed by Jeffrey R. French.*

Travel

Jerry Crescenti and Kirk Clawson traveled to Long Beach, California from January 9-14, 2000 to attend and present papers at the Annual Meeting of the American Meteorological Society.

Paula Fee traveled to Rosslyn, VA from January 10-14, 2000 to attend the first OAR Budget and Administrative Conference and to meet with personnel in the OAR and ARL offices in Silver Spring, MD.

Tom Watson traveled to Charlottsville, VA from January 19-21, 2000 to participate in the first meeting of the OAR Leadership Competencies Development Program.

Training

Brad Reese attended a National Seminar course entitled “Microsoft Windows NT” in Pocatello, ID January 25-26, 2000.